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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,349	08/21/2003	Pieter van Rooyen	1772/16131US02	6747
7590	04/14/2006			EXAMINER MULL, FRED H
Christopher C. Winslade McAndrews, Held & Malloy 500W. Madison Street Suite 3400 Chicago, IL 60661			ART UNIT 3662	PAPER NUMBER
DATE MAILED: 04/14/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/645,349	ROOYEN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Fred H. Mull	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 April 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-33 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 29-33 is/are allowed.  
 6) Claim(s) 1,5-10,14,15,17,19,20 and 24-28 is/are rejected.  
 7) Claim(s) 2-4,11-13,16,18, and 21-23 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 09 January 2006 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Response to Arguments***

1. Applicant's arguments with respect to the rejection(s) in the previous Office Action have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 6-9, 20, and 24-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Ferreol.

In regard to claims 1, 6-8, 20, and 24-27 Ferreol discloses:

receiving M replicas of the signal, each of the M replicas being received by one of a corresponding M physical antenna elements of the antenna array (2, Fig. 1; dots, Fig. 21);

determining M responses of the M physical antenna elements to the signal, each of the M responses corresponding to one of the M physical antenna elements (col. 12, lines 1-21); and

generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal, respectively associated with N spatial locations along the antenna array, wherein at least one of the N spatial locations is not coincident with a location of any of the M physical antenna elements (col. 12, lines 18-22; starts, Fig. 21; squares, Fig. 21), where the array is two-dimensional and the N spatial locations are along the two-dimensional array.

In regard to claims 9 and 28, Ferreol further discloses the signal complies with a communication protocol selected from the group consisting of: orthogonal frequency division multiplexing (OFDM), time division multiple access (TDMA), code division multiple access (CDMA), gaussian minimum shift keying (GMSK), complementary code keying (CCK), quadrature phase shift keying (QPSK), frequency shift keying (FSK), phase shift keying (PSK), and quadrature amplitude modulation (QAM) (col. 11, line 42).

3. Claims 10, 14-15, 17, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Saton.

Saton discloses:

an antenna array including M physical antenna elements, wherein the M physical antenna elements are spatially arranged to receive one of a corresponding M replicas of

the signal so as to be capable of generating M replicas of the received signal (A<sub>1</sub> to A<sub>5</sub>, Fig. 9); and

an array processing module including M signal processing chains, wherein each of the M signal processing chains is coupled to one of the M physical antenna elements (PS, TR<sub>1</sub> to TR<sub>5</sub>);

wherein the array processing module is configured to generate N signal response values for the antenna array as a function of the M replicas of the received signal; wherein the N signal response values include at least one virtual antenna response value, wherein N is greater than M (B<sub>1</sub> to B<sub>9</sub>).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferreol.

It is well known to downconvert RF signals to baseband before signal processing.

5. The examiner also finds the following reference(s) relevant, but not prior art:  
Davis (Fig. 12; ¶139) and Judd, previously cited, (Fig. 1C-1E; ¶20-33).

***Allowable Subject Matter***

6. Claim(s) 29-33 is/are allowed.
7. Claim(s) 2-4, 11-13, 16, 18, 21-23, and 28 is/are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred H. Mull whose telephone number is 571-272-6975. The examiner can normally be reached on Monday through Friday from approximately 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred H. Mull

Application/Control Number: 10/645,349  
Art Unit: 3662

Page 6

Examiner  
Art Unit 3662

fhm



THOMAS H. TARCZA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600